Claims

The invention claimed is:

1. A mobile wireless communication device having a vibration alert, the mobile wireless communication device comprising:

a housing;

a speaker attached to the housing, the speaker constructed to vibrate at a mechanical vibration resonant frequency;

sweep circuitry configured to produce a sweeping signal;

drive circuitry responsive to the sweeping signal, the drive circuitry coupled to the sweep circuitry and to the speaker and configured to drive the speaker at a sweeping frequency to cause the speaker to vibrate; and

control circuitry selectively activating the sweep circuitry.

2. The mobile wireless communication device of claim 1, wherein the mechanical vibration resonant frequency is in the frequency range of about 130 Hz to about 180 Hz.

3. The mobile wireless communication device of claim 1, wherein the drive signal is in the frequency range of about 100 Hz to about 250 Hz.

4. The mobile wireless communication device of claim 1, wherein the sweep circuitry drives the speaker by sweeping back and forth across the frequency range of the drive signal at a rate of about 50 Hz.

5. The mobile wireless communication device of claim 4, wherein the sweep circuitry sweeps back in forth across the range of the drive signal in a substantially sinusoidal pattern.

6. The mobile wireless communication device of claim 4, wherein the sweep circuitry sweeps back in forth across the range of the drive signal in discrete pattern.

7. A vibrator for a wireless phone, comprising:

a speaker constructed to resonate at a mechanical vibration resonant frequency;

a driver coupled to the speaker and constructed to generate a drive signal in a predetermined frequency range, wherein the mechanical vibration resonant frequency of the speaker is within the predetermined frequency range and the drive signal sweeps back and forth across the predetermined frequency range at a sweep frequency; and

control circuitry selectively activating the driver thereby causing the speaker to vibrate in the speaker's excitation frequency range.

8. The mobile wireless communication device of claim 7, wherein the speaker vibrates at the speaker's mechanical vibration resonant frequency.

9. The mobile wireless communication device of claim 8, wherein the mechanical vibration resonant frequency is in the frequency range of about 130 Hz to about 180 Hz.

10. The mobile wireless communication device of claim 7, wherein the drive signal is in the frequency range of about 100 Hz to about 250 Hz.

11. The mobile wireless communication device of claim 7, wherein the sweep circuitry drives the speaker by sweeping back and forth across the frequency range of the drive signal at a rate of about 50 Hz.

12. The mobile wireless communication device of claim 7, wherein the sweep circuitry sweeps back in forth across the range of drive signal in a substantially sinusoidal pattern.

13. The mobile wireless communication device of claim 6, wherein the sweep circuitry sweeps back in forth across the range of drive signal in a discrete pattern.

14. A method of generating a vibration alert on a mobile wireless communication device, comprising the steps of:

determining a range of mechanical vibration resonant frequencies for a plurality of speakers;

determining a sweep range and sweep frequency for the range of mechanical vibration resonant frequencies;

receiving and detecting a call signal;

determining if a vibration mode of the mobile wireless communication device is active;

activating a driver to drive the speaker with a drive signal;

sweeping the drive signal across the sweep range and at the sweep frequency thereby causing the speaker to vibrate in the speaker's excitation frequency range;

determining if the phone has been answered or the call has timed out; and

deactivating the driver.

15. The method of claim 14, wherein the step of sweeping the driving single causes the speaker to vibrate at the speaker's mechanical vibration resonant frequency.

16. The method of claim 14, wherein the mechanical vibration resonant frequency range is from about 130 Hz to about 180 Hz.

17. The method of claim 14, wherein sweep range is from about 100 Hz to about 250 Hz.

18. The method of claim 14, wherein the sweep frequency is about 50 Hz.

19. The method of claim 14, further including the step of:

sweeping the drive signal across the sweep range in a substantially sinusoidal pattern.

20. The method of claim 14, further including the step of:

sweeping the drive signal across the sweep range in a discrete pattern.

21. A method of receiving a vibration alert from a mobile wireless communication device, wherein the mobile wireless communications device includes a speaker selected from a group of speakers having a predetermined range of mechanical vibration resonant frequencies, the mobile wireless communications device further including a driver having a predetermined sweep range and a predetermined sweep frequency, the method comprising the steps of:

receiving and detecting a call signal;

generating a drive signal in response to the call signal to drive the speaker, wherein the drive signal sweeps across the predetermined range of vibration frequencies at the sweep frequency thereby causing the speaker to vibrate; and

alerting the user with the vibrations of the speaker.

22. The method of claim 21, wherein the mechanical vibration resonant frequencies are in the frequency range of about 130 Hz to about 180 Hz.

23. The method of claim 21 wherein sweep range is about 100 Hz to about 250 Hz.

24. The method of claim 21, wherein the sweep frequency is about 50 Hz.

25. The method of claim 21, further including the step of

sweeping the drive signal across the sweep range in a substantially sinusoidal pattern.

26. The method of claim 21, further including the step of

sweeping the drive signal across the sweep range in a discrete pattern.

27. A mobile wireless communication device, comprising:

a speaker having a mechanical vibration resonant frequency in an excitation frequency range;

driving means for driving the speaker with a drive signal, wherein the mechanical vibration resonant frequency is within a selected frequency range and the drive signal sweeps across the frequency range at a selected sweep rate to drive the speaker in the speaker's excitation frequency range thereby causing the speaker to vibrate.